U.S. House of Representatives
Committee on Science Hearing on
Research on Environmental and Safety Implications of Nanotechnology:
What Are The Federal Agencies Doing?

September 21, 2006

Questions for the Record Submitted to Dr. William Farland

Questions for the Record Submitted by Chairman Sherwood Boehlert

QUESTION 1:

In his testimony at the hearing on September 21, Dr. Andrew Maynard from the Wilson Center recommended that the government should ask the Board on Environmental Studies and Toxicology of the National Academies of Science to help develop a long-term research agenda and conduct rolling reviews for nanotechnology environmental and safety research. Dr. Maynard also recommended that the government should contract with the Health Effects Institute to manage and/or perform some of the highest priority research. What is your view of Dr. Maynard's recommendations?

RESPONSE:

The National Academies of Science (NAS) provides periodic reviews of the government activities under the National Nanotechnology Initiative (NNI) as required by the 21st Century Nanotechnology Research and Development Act of 2003. The NNI is managed within the framework of the National Science and Technology Council (NSTC), the Cabinet-level council by which the President coordinates science, space, and technology policies across the Federal Government. The Nanoscale Science Engineering and Technology (NSET) Subcommittee of the NSTC coordinates planning, budgeting, program implementation and review to ensure a balanced and comprehensive initiative. The NSET Subcommittee is composed of representatives from agencies participating in the NNI.

The NSET Subcommittee members value its relationship with NAS and hope to use it in the future to receive input and feedback from the Board on Environmental Studies and Toxicology (BEST) and other NAS Boards on research directions and priorities related to environmental, health and safety. However, the agencies that participate in NSET and its Nanotechnology Environmental and Health Implications Working Group (NEHI) have already made significant progress toward a long-term research agenda with the publication in September of the report "Environmental, Health and Safety Research Needs for Engineered Nanoscale Materials", and are committed to taking steps immediately to establish priorities for their research needs Given this progress, it seems most effective to utilize BEST and other NAS bodies to review, rather than to establish,

an additional long-term research agenda. EPA believes that the current NAS role provides timely and appropriate input to the government's research agenda.

EPA supports collaboration with the private sector and other stakeholders. While EPA has a positive relationship with the Health Effects Institute on air pollution research, we believe it is too early to conclude that the same model is appropriate for nanotechnology environmental and safety research. On October 18, EPA announced its intent to develop a stewardship program that would provide a valuable collaboration with industry and other stakeholders, and which we expect to result in significant new information being made available on nanomaterials. EPA is inviting the public, industry, environmental groups, other federal agencies and other stakeholders to participate in the design, development and implementation of this program. A successful stewardship program will complement the Agency's new and existing chemical programs under the Toxic Substances Control Act and can help provide a scientific foundation for regulatory decisions by encouraging the development of key scientific information and appropriate risk management practices.

QUESTION 2:

How has the Environmental Protection Agency (EPA) decided how much money to allocate to nanotechnology environmental and safety research? What impact will the report from the Nanotechnology Environmental and Health Implications Working Group have on EPA's nanotechnology research programs? What impact will it have on EPA's fiscal year 2008 budget request?

RESPONSE:

Determinations of research budget priorities are made in the context of the Agency's overall priorities and budget needs in concert with the Agency program offices. EPA also has allocated resources to new, emerging issues, such as nanotechnology, through its Science to Achieve Results (STAR) exploratory grants. Initial results from this STAR nanotechnology research and research by others helped clarify research gaps and opportunities that were considered as EPA increased its nanotechnology budget request from FY 06 to FY 07. The EPA's FY 08 budget process has been guided in part by the development of the Nanotechnology White Paper, which was released as a draft report in December 2005 for public comment. Over the past year, the process of developing the NEHI research needs document has provided additional insight into EPA's research needs. EPA has developed a nanotechnology research strategy framework which, along with the White paper should advance the NEHI efforts to develop an overall federal prioritized research strategy in this area.

QUESTION 3:

In your testimony on September 21, you laid out some specific priorities for nanotechnology environmental and safety research. To what extent do these

priorities overlap with the research that other federal agencies are sponsoring? To what extent do these priorities fill research gaps identified in the Wilson Center report? Of the research priorities that the Wilson Center identified, are there some priorities that EPA does not plan to investigate?

RESPONSE:

Our testimony on September 21 stated that EPA will conduct research to understand whether nanoparticles , in particular those with the greatest potential to be released into the environment and /or trigger a hazard concern, pose significant risks to human health or ecosysterms. We stated that we are uniquely positioned to lead in the ecosystem and exposure areas. A research framework included in the White Paper identifies specific near term priority research areas as fate, transport, transformation, exposure and monitoring, and detection technologies. The Agency has taken steps to ensure that the priority research areas will not overlap either with current research sponsored by other agencies or with their research priorities. EPA communicates regularly with other federal agencies concerning priorities through the NEHI and NSET and collaborates with other agencies on research solicitations to ensure that environmental and health issues are undertaken in a coordinated manner. For example, EPA has issued joint solicitations over the past two years with National Science Foundation, National Institute of Occupational Safety and Health and the National Institute of Environmental Health Sciences.

EPA's priorities are also consistent with those suggested in the Woodrow Wilson Center research document, which suggests the Agency give priority to the areas of exposure and monitoring/detection technologies with subsequent focus on ecotoxicity and life cycle approaches (found on pp. 34-36 of the report, http://www.nanotechproject.org/67/7-19-06-nanotechnology-a-research-strategy-for-addressing-risk). All of these areas are contained within the priorities identified in the recent testimony and the draft White Paper. While the Wilson Center report does not mention fate, transport and transformation explicitly, these areas are critical to understanding both exposure and toxicity – whether ecological or human – as well as life cycle considerations.

QUESTION 4:

EPA released a draft white paper on its research needs for the environmental and safety impacts of nanotechnology for public comment last year. Your written testimony said that it complements the report released today. In what way are they complementary? When will the white paper be finalized? Will you be revising it based on today's report? Will the final version identify short-, medium- and long-term priorities?

RESPONSE:

The Nanotechnology White Paper was recently approved by the Agency's Science Policy Council, so EPA anticipates that the final version will be released to the public soon.

The draft White Paper provides an extensive review of research needs for both environmental applications and implications of nanotechnology. To help EPA focus on priorities for the near term, the draft concludes with recommendations on the next steps for addressing science policy issues and research needs. In addition, it includes in Appendix C, a description of EPA's framework for nanotechnology research, which outlines how EPA will strategically focus its own research program (as outlined in the September testimony) to provide key information on potential environmental impacts from human or ecological exposure to nanomaterials in a manner that complements federal, academic, and private-sector research activities. Collaboration with other researchers is a major focus of the draft paper.

EPA was represented on the committee that developed the NEHI report, and played a key role in identifying research needs. As such, there is no need to modify the white paper since the two reports complement one other. The NEHI report was designed to give an overview of environmental, health and safety research needs for all federal agencies. The research needs identified in EPA's draft White Paper were included in the NEHI report. As the NEHI prioritizes needs, those areas that fall within the mission and expertise of the EPA will be addressed in the context of the Agency's overall research priorities and budget.

Questions for the Record Submitted by
Ranking Minority Member Bart Gordon

QUESTION 1:

In his testimony at the hearing, Dr. Maynard suggested a mechanism for government to partner with industry to fund EHS research that would support the needs of government in formulating a regulatory framework for nanomaterials and the needs of industry on how to develop nanotechnology safely. The idea is to use the Health Effects Institute model, which studies the health effects of air pollution. What are your views on this suggestion: would this be a workable approach for instituting a government/industry partnership for support of EHS research related to nanotechnology?

RESPONSE:

EPA supports collaboration with the private sector and other stakeholders, and EPA has a positive relationship with the Heath Effects Institute on air pollution research. However, we believe it is too early to conclude that the same model is appropriate for nanotechnology environmental and safety research. On October 18, EPA announced its intent to develop a stewardship program that would provide a valuable collaboration that could result in significant new information that will help the Agency better understand the potential risks and benefits of nanotechnology. EPA is inviting the public, industry, environmental groups, other federal agencies and other stakeholders to participate in the design, development and implementation of this program. A successful stewardship program will complement the Agency's new and existing chemical programs under the Toxic Substances Control Act and can help provide a scientific foundation for regulatory decisions by encouraging the development of key scientific information and appropriate risk management practices.

QUESTION 2:

In responses to questions at the hearing, the agency witnesses seemed to be saying the current planning/coordinating mechanism for EHS research based on the NEHI working group will be able to produce an EHS research plan or roadmap, consisting of a cross-agency set of specific research priorities, timelines, and associated funding targets broken out by agency. What adjustments are needed to the way NEHI functions or to the way it is staffed to achieve this goal in a timely way?

RESPONSE:

The Agency does not believe any alterations nor changes in the NEHI staffing or functionality are required to prioritize the research needs that are identified in the NEHI report. As indicated above, EPA has already developed its own prioritized research strategy, and will work with other agencies through the NEHI to develop a coordinated cross-agency set of research priorities in a timely manner.